

2001 Chevrolet S10 Pickup

2000-01 BRAKES Anti-Lock - 4WAL - "S" & "T" Series

2000-01 BRAKES

Anti-Lock - 4WAL - "S" & "T" Series

MODEL IDENTIFICATION

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Series ⁽¹⁾	Model
"S"	2WD Blazer, Bravada, Envoy, Jimmy, Pickup & Sonoma
"T"	AWD Bravada, 4WD Blazer, Envoy, Jimmy, Pickup & Sonoma
(1) Vehicle series is fifth character of VIN.	

DESCRIPTION

The Kelsey-Hayes EBC310 (Black cover) and EBC325 (Gray cover) 4-Wheel Anti-Lock (4WAL) brake systems are used. The EB310 is used on all 2000 model year vehicles except the "S" and "T" Series pickups and 2-door utility vehicles, which use the EB325. All 2001 model year vehicles use the Kelsey-Hayes EB325 ABS system. The EB325 is smaller in size and weight, has fewer electrical connections (3), tube adapter is not used and combination valve is not mounted to BPMV.

The ABS prevents wheel lock-up during heavy braking. This allows driver to maintain steering control while stopping vehicle in shortest distance possible. The system consists of Brake Pressure Modulator Valve (BPMV), Powertrain Control Module (PCM), Vehicle Speed Sensor (VSS) or Vehicle Control Module (VCM), Wheel Speed Sensors (WSS), warning lights, electrical wiring and hydraulic lines.

The Electro-Hydraulic Control Unit (EHCU) is the entire unit, including the BPMV, Electronic Brake Control Module (EBCM) and combination valve. The EBCM is the electronic control portion of ABS assembly and is mounted on top of BPMV. EHCU is located in left rear of engine compartment, near brake master cylinder.

OPERATION

When ignition is turned to RUN position, the instrument cluster starts a bulb check by illuminating the ANTILOCK and BRAKE indicator lights. The bulb check ends when instrument cluster receives a class 2 serial data message from EBCM and BCM that no malfunctions were detected. If no malfunctions were detected, instrument cluster will turn off ANTILOCK indicator light after 2 seconds and BRAKE indicator light will turn off a second later. This confirms correct operation of EBCM and indicator lights. If EBCM detects a malfunction, either on power-up or during operation, it will notify the instrument cluster via the class 2 message to illuminate ANTILOCK indicator light. If malfunction

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affects operation of the base brakes, the BRAKE indicator light may be illuminated as well.

The ANTILOCK indicator illuminates when EBCM detects a permanent ignition or condition latched DTC, or instrument cluster cannot communicate with EBCM module using class 2 serial data communications. The BRAKE indicator light will illuminate when parking brake is not released, Dynamic Rear Proportioning (DRP) registers a critical malfunction, there is 2 or more DRP non-critical malfunctions, or brake fluid level is low.

BLEEDING BRAKE SYSTEM

ABS BLEEDING PROCEDURE

NOTE: **Bleeding ABS requires use of Tech 2 scan tool. An assistant is required when performing bleeding procedures.**

1. Raise and support vehicle. Begin bleeding at right rear wheel. Install a clear plastic hose to bleed screw. Immerse other end of hose in container that is partially filled with clean brake fluid.
2. Open bleed screw 1/2 to 1 full turn. Have assistant slowly depress brake pedal until it reaches full travel. Hold pedal until bleed screw is closed. Release brake pedal and wait 10-15 seconds. Repeat until clean bubble-free brake fluid is present at wheel bleed screw.
3. Check master cylinder fluid level every 4-6 strokes of brake pedal to avoid running system dry. Repeat procedure on left rear, then right front, then left front. After bleeding all 4 wheels, go to next step.
4. Evaluate feel of brake pedal before attempting to drive vehicle. Bleed system as many times as necessary to obtain appropriate pedal feel.

DIAGNOSIS & TESTING

NOTE: **When testing and diagnosing 4WAL system, use of Tech 2 scan tool is required.**

The Electronic Brake Control Module (EBCM) performs a self-diagnosis of the ABS. The EBCM detects and isolated system failures, then sets the corresponding diagnostic trouble code.

Before diagnosing 4WAL system, perform a comprehensive visual inspection of system by checking wiring harness connectors, harness routing (pay particular attention to wheel speed sensor wiring harness routing), applicable fuses in fuse block, and ground connections. Ensure brake fluid level in master cylinder reservoir is full.

Start 4WAL system diagnosis using **DIAGNOSTIC SYSTEM CHECK** . If failures are found when performing diagnostic system check, you will be directed to enter diagnostics to

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retrieve DTCs or perform **SYMPTOM DIAGNOSIS** . Diagnostic system check may indicate that system is functioning properly.

RETRIEVING DIAGNOSTIC TROUBLE CODES

Connect Tech 2 scan tool to DLC located under steering column. Access ABS DTCs. Repair DTCs in the order they appear. See **DIAGNOSTIC TROUBLE CODE DEFINITIONS** table for diagnosis. Before diagnosing DTC(s), perform **DIAGNOSTIC SYSTEM CHECK** .

DIAGNOSTIC TROUBLE CODE DEFINITIONS

DTC	(1) Definition
<u>C0221</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0222</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0223</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0224</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0225</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0226</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0227</u>	Wheel Speed Sensor Circuit Malfunction
<u>C0229</u>	Drop Out Of Front Wheel Speed Sensor Signals
<u>C0235</u>	Rear Speed Sensor Signal Circuit
<u>C0236</u>	Rear Speed Sensor Signal Circuit
<u>C0237</u>	Rear Speed Sensor Signal Circuit
<u>C0238</u>	Wheel Speed Mismatch
<u>C0241</u>	EBCM Control Valve Circuit
<u>C0242</u>	EBCM Control Valve Circuit
<u>C0243</u>	EBCM Control Valve Circuit
<u>C0244</u>	EBCM Control Valve Circuit
<u>C0245</u>	EBCM Control Valve Circuit
<u>C0246</u>	EBCM Control Valve Circuit
<u>C0247</u>	EBCM Control Valve Circuit
<u>C0248</u>	EBCM Control Valve Circuit
<u>C0249</u>	EBCM Control Valve Circuit
<u>C0250</u>	EBCM Control Valve Circuit
<u>C0251</u>	EBCM Control Valve Circuit
<u>C0252</u>	EBCM Control Valve Circuit
<u>C0253</u>	EBCM Control Valve Circuit
<u>C0254</u>	EBCM Control Valve Circuit
<u>C0265</u>	EBCM Relay Circuit
<u>C0266</u>	EBCM Relay Circuit

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C0267	Pump Motor Circuit Open/Shorted
C0268	Pump Motor Circuit Open/Shorted
C0269	Excessive Dump/Isolation Time
C0271	EBCM Malfunction
C0272	EBCM Malfunction
C0273	EBCM Malfunction
C0274	Excessive Dump/Isolation Time
C0281	Stoplight Switch Circuit
C0284	EBCM Malfunction

(1) Always perform DIAGNOSTIC SYSTEM CHECK before performing DTC tests.

CLEARING DIAGNOSTIC TROUBLE CODES

Use a scan tool to clear DTCs in EBCM memory. After clearing DTCs, verify proper system operation. EBCM will not permit DTC clearing until all DTCs have been displayed. DTCs cannot be cleared by disconnecting the battery cables, unplugging the EBCM or turning ignition off.

SYMPTOM DIAGNOSIS

NOTE: If no DTCs are stored, perform symptom diagnostic test as necessary. See **SYMPTOM DIAGNOSTIC INDEX** table.

SYMPTOM DIAGNOSTIC INDEX

Symptom	(1) Test
ABS Indicator Always On	A
ABS Indicator Inoperative	B
Scan Tool Does Not Communicate With Class 2 Device	C

(1) See appropriate test under SYMPTOM TESTS.

DIAGNOSTIC SYSTEM CHECK

NOTE: For circuit reference, see **WIRING DIAGRAMS**.

1. Install scan tool. If scan tool powers up, go to next step. If scan tool does not power up, diagnose data link communications. See DATA LINK CONNECTORS article in WIRING DIAGRAMS.
2. Turn ignition on. Using scan tool, attempt to establish communication with EBCM, VCM, instrument panel cluster and BCM. If scan tool communicates with all of the

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control modules, go to next step. If scan tool does not communicate with any of the control modules, go to **TEST C: SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE** under **SYMPTOM DIAGNOSIS** .

3. Using scan tool, display DTCs for EBCM, VCM and instrument panel cluster. If scan tool displays any related DTCs, go to next step. If scan tool does not display any related DTCs, see **SYMPTOM DIAGNOSIS** .
4. If scan tool displays any "U" type DTC, go to **TEST C: SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE** under **SYMPTOM DIAGNOSIS** . If any other DTCs are set, go to next step.
5. If scan tool displays DTC P0500, P0502, P0503, P0562, P0563 or P0601, diagnose affected DTC(s). Go to appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

SYMPTOM DIAGNOSIS

NOTE: For terminal and circuit identification, see **WIRING DIAGRAMS**.

TEST A: ABS INDICATOR ALWAYS ON

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under **DIAGNOSIS & TESTING**. After performing diagnostic system check, go to next step.
2. Turn ignition off for 5 seconds. Turn ignition on and observe ABS indicator light. If ABS indicator light illuminates for 2 seconds, then turns off, problem is intermittent. If ABS indicator light does not illuminate or illuminates and does not turn off, go to next step.
3. Using scan tool, select Instrument Panel Cluster (IPC) special functions menu. Command ABS indicator light off. If ABS indicator light turns off, go to step 5 . If ABS indicator light does not turn off, go to next step.
4. Replace IPC. After replacing IPC, go to step 6 .
5. Replace EBCM and perform tire size calibration procedure using scan tool. After replacing EBCM, go to next step.
6. Turn ignition off for 5 seconds. Turn ignition on and observe ABS indicator light. If ABS indicator light illuminates for 2 seconds, then turns off, system is okay. If ABS indicator light does not illuminate or illuminates and does not turn off, go to step 3 .

TEST B: ABS INDICATOR INOPERATIVE

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** . After performing diagnostic system check, go to next step.
2. Turn ignition off for 5 seconds. Turn ignition on. Observe ABS indicator light. If ABS indicator light illuminates, problem is intermittent. If ABS indicator light does not

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illuminate, go to next step.

3. Replace IPC. After replacing IPC, go to **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING.

TEST C: SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE

1. Install scan tool. If scan tool powers up, go to next step. If scan tool does not power up, diagnose data link connector circuit. See DATA LINK CONNECTORS article in WIRING DIAGRAMS.
2. Turn ignition on, with engine off. Using scan tool, attempt to communicate with each module on class 2 circuit. If scan tool communicates with any module on the class 2 serial data circuit, go to next step. If scan tool does not communicate with any module on the class 2 serial data circuit, go to step 5 .
3. Using scan tool, select display DTCs function for each module. Record all of displayed DTCs, DTC status and module which set the DTC. If recorded DTCs are in the range of U1000 to U1255, go to next step. If no DTCs are recorded, problem is intermittent.
4. If DTC U1000 or U1255 is the only DTC displayed, diagnose affected DTC(s). See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.
5. Turn ignition off. Disconnect scan tool from DLC. Check for poor connections at DLC ground terminals. Repair as necessary. If connections are okay, go to next step.
6. Check for open in DLC signal return circuit. Repair as necessary. If circuit is okay, go to next step.
7. Remove comb from SP201 splice connector. Check for poor connections at SP201. Check continuity between pin "A" and all other pins at SP201. Repair as necessary. If connections are okay, go to next step.
8. Check DLC class 2 circuit for open or short in circuit. Repair as necessary. If circuit is okay, go to next step.
9. Connect a jumper wire to each end of both Body Control Module (BCM) class 2 serial data circuits. Turn ignition on, with engine off. Using scan tool, attempt to communicate with BCM. If scan tool communicates with BCM, go to step 11 . If scan tool does not communicate with BCM, go to next step.
10. Turn ignition off. Disconnect BCM harness connectors C1 and C2. Check BCM class 2 circuits for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to battery negative voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
11. Leave jumper wires connected to BCM class 2 circuit. Connect another jumper wire to each end of PCM class 2 circuit. Turn ignition on, with engine off. Using scan tool, attempt to communicate with PCM. If scan tool communicates with PCM, go to step 13 . If scan tool does not communicate with PCM, go to next step.
12. Turn ignition off. Disconnect PCM harness connector C1. Check PCM class 2 circuit

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for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .

13. Remove jumper wire from PCM class 2 circuit. Connect jumper wire to the end of Transfer Case Shift Control Module (TCSCM) control module class 2 circuit. Turn ignition on, with engine off. Using scan tool, attempt to communicate with TCSCM. If scan tool communicates with TCSCM, go to step 15 . If scan tool does not communicate with TCSCM, go to next step.
14. Turn ignition off. Disconnect TCSCM harness connector containing the TCSCM class 2 circuit. Check TCSCM class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
15. Disconnect jumper wire from TCSCM class 2 circuit. Connect jumper wire to end of Vehicle Interface Unit (VIU) class 2 circuit. Turn ignition on, with engine off. Using scan tool, attempt to communicate with VIU. If scan tool communicates with VIU, go to step 17 . If scan tool does not communicate with VIU, go to next step.
16. Turn ignition off. Disconnect VIU harness connector. Check VIU class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
17. Remove jumper wire from VIU class 2 circuit. Connect jumper wire to the end of EBCM class 2 circuit. Turn ignition on, with engine off. Using scan tool, attempt to communicate with EBCM. If scan tool communicates with EBCM, go to step 19 . If scan tool does not communicate with EBCM, go to next step.
18. Turn ignition off. Disconnect EBCM harness connector C1. Check EBCM class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to battery positive voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
19. Remove jumper wire from EBCM class 2 circuit. Connect jumper wire to the end of inflatable restraint Sensing and Diagnostic Module (SDM) class 2 circuit. Turn ignition on, with engine off. Using scan tool, attempt to communicate with SDM. If scan tool communicates with SDM, go to step 21 . If scan tool does not communicate with SDM, go to next step.
20. Turn ignition off. Disconnect SDM harness connector. Check SDM class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
21. Remove jumper wire from SDM class 2 circuit. Connect jumper wire to the end of Instrument Panel Cluster (IPC) class 2 circuit. Turn ignition on, with engine off. Using scan tool, attempt to communicate with IPC. If scan tool communicates with IPC, go to step 23 . If scan tool does not communicate with IPC, go to next step.

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22. Turn ignition off. Disconnect IPC harness connector. Check IPC class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to battery positive voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
23. Remove jumper wire from IPC class 2 circuit. Connect jumper wire to the end of Memory Seat Module (MSM). Turn ignition on, with engine off. Using scan tool, attempt to communicate with MSM. If scan tool communicates with MSM, go to step 25 . If scan tool does not communicate with MSM, go to next step.
24. Turn ignition off. Disconnect MSM harness connector C1. Check MSM class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to battery positive voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to step 29 .
25. Remove jumper wire from MSM class 2 circuit. Connect jumper wire to the end of Driver Information Center (DIC). Turn ignition on, with engine off. Using scan tool, attempt to communicate with DIC. If scan tool communicates with DIC, go to step 31 . If scan tool does not communicate with DIC, go to next step.
26. Turn ignition off. Disconnect DIC harness connector C1. Check DIC class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to battery positive voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to next step.
27. Remove jumper wire from DIC class 2 circuit. Connect jumper wire to the end of Electronic Climate Control (ECC) module. Turn ignition on, with engine off. Using scan tool, attempt to communicate with ECC module. If scan tool communicates with ECC module, go to step 31 . If scan tool does not communicate with ECC module, go to next step.
28. Turn ignition off. Disconnect ECC module harness connector. Check ECC module class 2 circuit for short to battery negative voltage or short to battery positive voltage. Turn ignition on, with engine off when testing for short to battery positive voltage. Repair as necessary. After repairs, go to step 31 . If circuit is okay, go to next step.
29. Check for poor connections at class 2 circuit of module that is not communicating. Repair as necessary. After repairs, go to step 31 . If connections are okay, go to next step.
30. Replace module which is not communicating. After replacing affected module, go to next step.
31. Reconnect all modules and connectors. Connect scan tool. Turn ignition on, with engine off. Wait 10 seconds. Scan tool may require a power up reset before communication will occur due to a short on the class 2 circuit. Turn off or disconnect scan tool prior to performing this test. Using scan tool, select display DTCs function for each module. Record all displayed DTCs and DTC status. If DTCs are recorded, go to next step.
32. Diagnose affected DTCs. After repairs, clear DTCS using scan tool.

DIAGNOSTIC TESTS

NOTE: To identify the circuits and wire colors referenced in testing, see **WIRING DIAGRAMS** . After repairs, recheck system operation to verify problem has been repaired. See **DIAGNOSTIC SYSTEM CHECK** under **DIAGNOSIS & TESTING**.

DTC C0221, DTC C0222, DTC C0223, DTC C0224, DTC C0225, DTC C0226, DTC C0227: WHEEL SPEED SENSOR CIRCUIT MALFUNCTION

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** . After performing diagnostic system check, go to next step.
2. Using scan tool, clear DTCs. Turn ignition on. Recheck DTCs. If DTC resets, go to next step. If DTC does not reset, problem is intermittent.
3. Raise and support vehicle. Disconnect wheel speed sensor harness connector. Using a DVOM, check resistance of wheel speed sensor. If resistance is 700-2000 ohms, go to next step. If resistance is not 700-2000 ohms, go to step 8 .
4. Manually spin wheel as fast as possible. Using a DVOM, measure AC voltage generated by sensor as wheel spins. If voltage reading is greater than 100 mV, go to next step. If voltage reading is not greater than 100 mV, go to step 8 .
5. Check for poor connections at wheel speed sensor harness connector. Repair as necessary. After repairs, go to step 10 . If connections are okay, go to next step.
6. Disconnect EBCM harness connector. Check wheel speed sensor circuits for open, short to ground, short to voltage or circuit shorted together. Repair as necessary. After repairs, go to step 10 . If circuit is okay, go to next step.
7. Check for poor connections at EBCM harness connector. Repair as necessary. After repairs, go to step 10 . If connections are okay, go to step 9 .
8. Replace wheel speed sensor. After replacing sensor, go to step 10 .
9. Replace EBCM. After replacing EBCM, go to next step.
10. Using scan tool, clear DTCs. Operate vehicle at speeds greater than 20 MPH. Recheck DTCs. If DTC resets, go to step 3 . If DTC does not reset, system is okay.

DTC C0229: DROP OUT OF FRONT WHEEL SPEED SENSOR SIGNALS

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under **DIAGNOSIS & TESTING**. After performing diagnostic system check, go to next step.
2. Using a scan tool, clear DTCs. Drive vehicle at speeds greater than 12 MPH. Recheck DTCs. If DTC resets, go to next step. If DTC does not reset, problem is intermittent.
3. Check for poor connections at EBCM harness connector. Repair as necessary. After repairs, go to step 5 . If connections are okay, go to next step.
4. Replace EBCM and perform tire size calibration using scan tool. After replacing EBCM, go to next step.

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5. Using scan tool, clear DTCs. Drive vehicle at speeds greater than 12 MPH. Recheck DTCs. If DTC resets, go to step 3 . If DTC does not reset, system is okay.

DTC C0235, DTC C0236, DTC C0237: REAR SPEED SENSOR SIGNAL CIRCUIT

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. After performing diagnostic system check, go to next step.
2. Using scan tool, clear DTCs. Recheck DTCs. If DTC resets, go to next step. If DTC does not reset, problem is intermittent.
3. Turn ignition off. Disconnect EBCM harness connector containing the vehicle speed signal circuit. Turn ignition on. Using DVOM, check voltage between vehicle speed signal circuit and good ground. If voltage reading is greater than 10 volts, go to next step. If voltage reading is not greater than 10 volts, go to step 7 .
4. Check for poor connections at EBCM harness connector. Repair as necessary. After repairs, go to step 9 . If connections are okay, go to next step.
5. Replace EBCM and perform tire size calibration procedure using scan tool. After replacing EBCM, go to step 9 .
6. Check vehicle speed signal circuit for open, short to ground or short to voltage. Repair as necessary. After repairs, go to step 9 . If circuit is okay, go to next step.
7. Check for poor connections at PCM/VCM harness connector. Repair as necessary. After repairs, go to step 9 . If connections are okay, go to next step.
8. Replace PCM/VCM. After replacing module, go to next step.
9. Turn ignition on. Ensure vehicle is not moving. Using scan tool, recheck DTCs. If DTC resets, go to step 2 . If DTC does not reset, system is okay.

DTC C0238: WHEEL SPEED MISMATCH

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. After performing diagnostic system check, go to next step.
2. Check both front tires for equal size. If both tires are of equal size, go to next step. If tires are not of equal size, replace tires.
3. Check both rear tires for equal size. If both tires of equal size, go to next step. If tires are not of equal size, replace tires.
4. Using scan tool, verify EBCM and PCM/VCM both have the correct tire size calibration. View EBCM tire size calibration or perform the tire size calibration procedure using scan tool. Repair as necessary. After repairs, go to next step. If tire size calibration is okay, problem is intermittent.
5. Using scan tool, clear DTCs. Operate vehicle 2 miles at speeds greater than 15 MPH. Recheck DTCs. If DTC resets, go to step 2 . If DTC does not reset, system is okay.

DTC C0241, DTC C0242, DTC C0243, DTC C0244, DTC C0245, DTC C0246, DTC C0247, DTC C0248, DTC C0249, DTC C0250, DTC C0251, DTC C0252, DTC C0253, DTC C0254: EBCM

CONTROL VALVE CIRCUIT

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. After performing diagnostic system check, go to next step.
2. Using scan tool, clear DTC(s). Using scan tool, perform ABS function test. Recheck DTCs. If DTC resets, go to next step. If DTC does not reset, problem is intermittent.
3. Check for poor connections at EBCM harness connector. Repair as necessary. After repairs, go to step 5 . If connections are okay, go to next step.
4. Replace EBCM and perform tire size calibration procedure using scan tool. After replacing EBCM, go to next step.
5. Turn ignition on and complete bulb check. Using scan tool, clear DTCs. If DTC resets, go to step 2 . If DTC does not reset, system is okay.

DTC C0265 OR DTC C0266: EBCM RELAY CIRCUIT

NOTE: **The number below refers to the step number on the diagnostic table.**

4. This step tests if the battery positive voltage circuit can supply adequate power to the EBCM internal relay.

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. After performing diagnostic system check, go to next step.
2. Use a scan tool in order to clear the DTC(s). Use the scan tool in order to perform an ABS Relay Test. Does DTC C0266 set? If so, go to step 6 . If not, go to next step.
3. Does DTC C0265 set? If so, go to next step. If not, go to **Diagnostic Aids** .
4. Turn the ignition OFF. Disconnect connector C2 from the EBCM. Connect a test lamp between the battery positive voltage circuit at connector C2 and a good ground. Does the test lamp illuminate? If so, go to step 6 . If not, go to next step.
5. Repair the open in the battery positive voltage circuit. After repairs are complete, go to step 8 .
6. Inspect for poor connections at the harness connector of the EBCM. Did you find and correct the condition? If so, go to step 8 . If not, go to next step.

NOTE: **Important: Perform the Tire Size Calibration procedure.**

7. Replace the EBCM. See **ELECTRONIC BRAKE CONTROL MODULE (EBCM)** . Go to next step.
8. Use a scan tool in order to clear the DTC. Use the scan tool in order to perform an ABS Relay Test. Does the DTC set? If so, go to step 4 . If not, system is okay.

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Diagnostic Aids

An intermittent DTC C0265 may be caused by a problem in the battery positive voltage circuit wiring or connection to the EBCM. Thoroughly inspect connections or circuitry that may cause an intermittent malfunction. Inspect for the following:

- Backed out terminals
- Improper mating
- Broken locks
- Corrosion
- Improperly formed or damaged terminals
- Poor terminal-to-wiring connections
- Physically damaged wiring
- Wiring broken inside the insulation

DTC C0267 OR DTC C0268: PUMP MOTOR CIRCUIT OPEN/SHORTED

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. After performing diagnostic system check, go to next step.
2. Turn ignition off. Disconnect 2-pin pump harness connector from EBCM. Check connector and wiring for corrosion or damage causing an open circuit between pump and EBCM. If no problem is found, go to next step. If a problem is found, go to step 4 .
3. Using a DVOM, check resistance between pump 2-pin harness connector. If resistance is 0.1-1.0 ohms, go to next step. If resistance is not 0.1-1.0 ohms, go to step 6 .
4. Repair connector or circuit. After repairs, go to step 7 .
5. Replace EBCM. After replacing EBCM, go to step 7 .
6. Replace BPMV. After replacing BPMV, go to next step.
7. Turn ignition on. Recheck DTCs. If DTC resets, go to step 2 . If DTC does not reset, system is okay.

DTC C0269 OR DTC C0274: EXCESSIVE DUMP/ISOLATION TIME

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. After performing diagnostic system check, go to next step.
2. Install scan tool. Using scan tool, clear DTC(s). Using scan tool, perform function test. Recheck DTCs. If DTC resets, go to next step. If DTC does not reset, go to step 4 .
3. Replace BPMV. After replacing BPMV, go to next step.
4. Turn ignition on and complete ABS bulb check. Recheck DTCs. If DTC resets, go to step 2 . If DTC does not reset, system is okay.

DTC C0271, DTC C0272, DTC C0273 OR DTC C0284: EBCM MALFUNCTION

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1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under **DIAGNOSIS & TESTING**. After performing diagnostic system check, go to next step.
2. If DTC C0271 or C0272 is set, go to step 4 . If DTC C0271 or C0272 is not set, go to next step.
3. Using scan tool, clear DTCs. Turn ignition off for 5 seconds. Turn ignition on. Recheck DTCs. If DTC resets, go to next step. If DTC does not reset, problem is intermittent.
4. Replace EBCM and perform tire size calibration procedure using scan tool.

DTC C0281: STOPLIGHT SWITCH CIRCUIT

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under **DIAGNOSIS & TESTING**. After performing diagnostic system check, go to next step.
2. Turn ignition on, with engine off. Using scan tool, observe brake switch status parameter in 4WAL 3-sensor data list. If scan tool displays OFF, go to next step. If scan tool does not display OFF, go to step 4 .
3. Apply brake pedal. Using scan tool, observe brake switch status parameter. If brake switch status parameter changes state, problem is intermittent. If brake switch status parameter does not change state, go to next step.
4. Turn ignition off. Disconnect stoplight switch. Turn ignition on, with engine off . Using scan tool, observe brake switch status parameter. If scan tool displays OFF, go to step [7](#) . If scan tool does not display OFF, go to next step.
5. Check EBCM brake switch input circuit for short to voltage. Repair as necessary. After repairs, go to step 10 . If circuit is okay, go to next step.
6. Check for poor connections at EBCM harness connector. Repair as necessary. After repairs, go to step 10 . If connections are okay, go to step 8 .
7. Check for poor connections at stoplight switch harness connector. Repair as necessary. After repairs, go to step 10 . If connections are okay, go to step 9 .
8. Replace EBCM. After replacing EBCM, go to step 10 .
9. Replace stoplight switch. After replacing switch, go to next step.
10. Using scan tool, clear DTCs. Recheck for DTCs. If DTC resets, go to step 2 . If DTC does not reset, system is okay.

REMOVAL & INSTALLATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

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ELECTRONIC BRAKE CONTROL MODULE (EBCM) & BRAKE PRESSURE MODULATOR VALVE (BPMV)

Removal & Installation

1. Turn ignition off. Disconnect negative battery terminal. Wash all contaminants from Electro-Hydraulic Control Unit (EHCUC). Disconnect harness connector from EBCM. Remove EHCUC mounting bracket and EHCUC.
2. Remove mounting bracket from EHCUC. Remove EBCM mounting screws from BPMV. DO NOT use a tool to pry EBCM from BPMV. Separate EBCM from BPMV. If replacing EBCM, remove combination valve from EBCM.

NOTE: DO NOT use RTV or other type of sealant on EBCM gasket or mating surfaces.

3. To install, reverse removal procedure. Calibrate new EBCM to vehicle tire size using a scan tool. Tighten NEW BPMV-to-EBCM mounting screws in criss-cross pattern and to specified torque. See **TORQUE SPECIFICATIONS**.

WHEEL SPEED SENSOR

NOTE: For installation purposes, note speed sensor wire routing before removing. Misrouted wiring may cause electromagnetic interference failures. Wheel speed sensor and splash shield are replaced as an assembly.

Removal & Installation

1. Raise and support vehicle. Remove wheel. Remove brake caliper, and wire aside. Remove hub and rotor. Disconnect wheel speed sensor connector. Remove speed sensor cable harness clips. Remove speed sensor mounting bolts. Remove splash shield mounting bolts. Remove splash shield and sensor assembly.
2. Clean gasket and knuckle surfaces thoroughly with a dry cloth. To install, reverse removal procedure. Tighten splash shield mounting bolt to specifications. See **TORQUE SPECIFICATIONS** table. On 2WD models, tighten wheel bearing hub nut to 16 ft. lbs. (12 N.m), while turning hub assembly forward. On 4WD models, tighten drive axle nut to 103 ft. lbs. (140 N.m). Speed sensor air gap is non-adjustable.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Axle Nut (4WD)	103 (140)
Brake Caliper Mounting Bolt	38 (52)

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BPMV Tube Adapters	23 (31)
Brakeline Fitting (Front & Rear)	22 (29)
Combination Valve-To-BPMV	12 (16)
EHCUC Bracket Mounting Bolt	20 (25)
Front Wheel Speed Sensor Bolt	13 (18)
Splash Shield Bolt	12 (16)
Wheel Bearing Adjuster Nut (2WD)	12 (16)
Wheel Lug Nut	95 (130)
INCH Lbs. (N.m)	
BPMV-To-EBCM Screws	39 (5)
EHCUC-To-Bracket Bolt	84 (9)

WIRING DIAGRAMS

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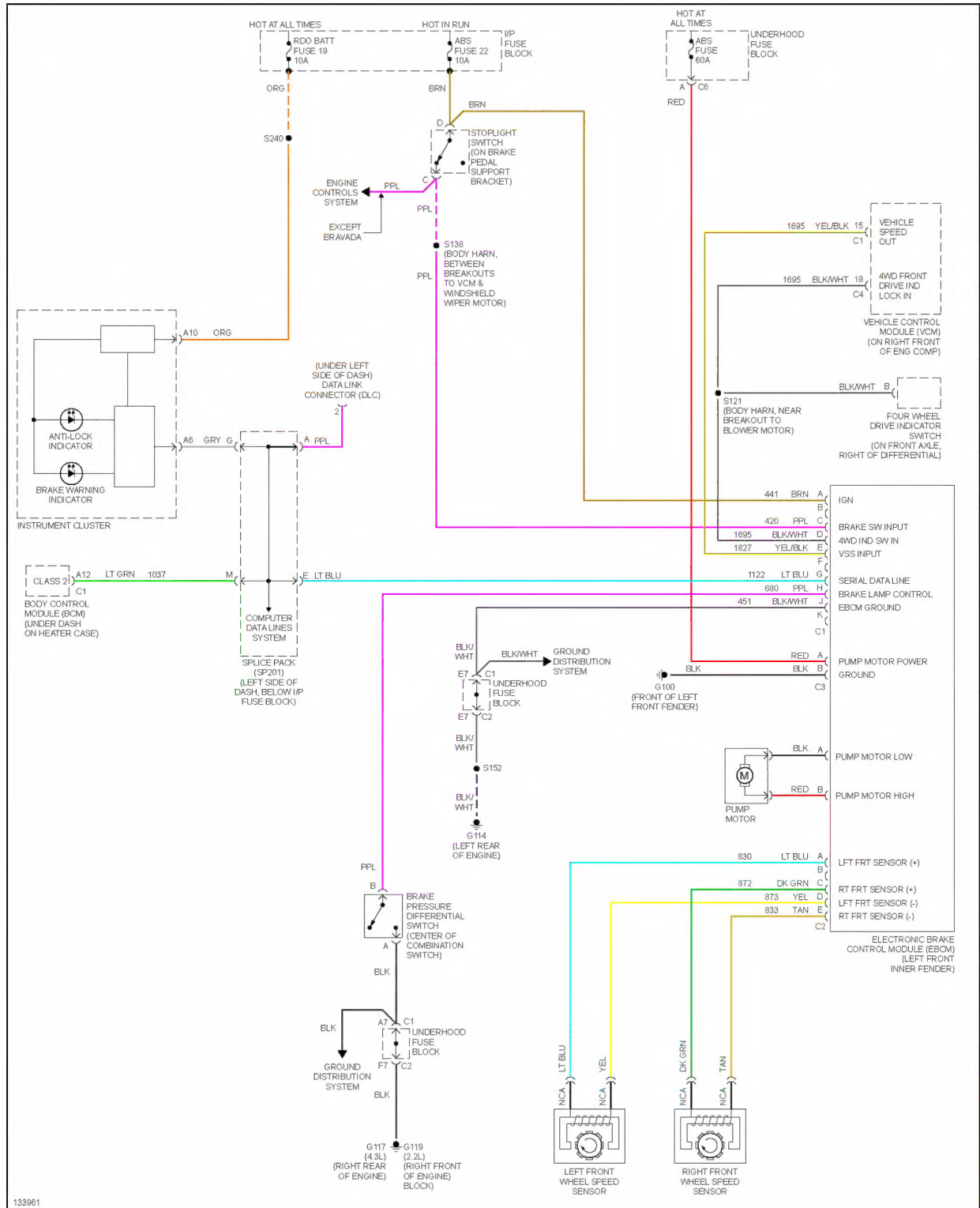


Fig. 1: 4WAL Brake System Wiring Diagram ("S" & "T" Series EBC310 - 2000)

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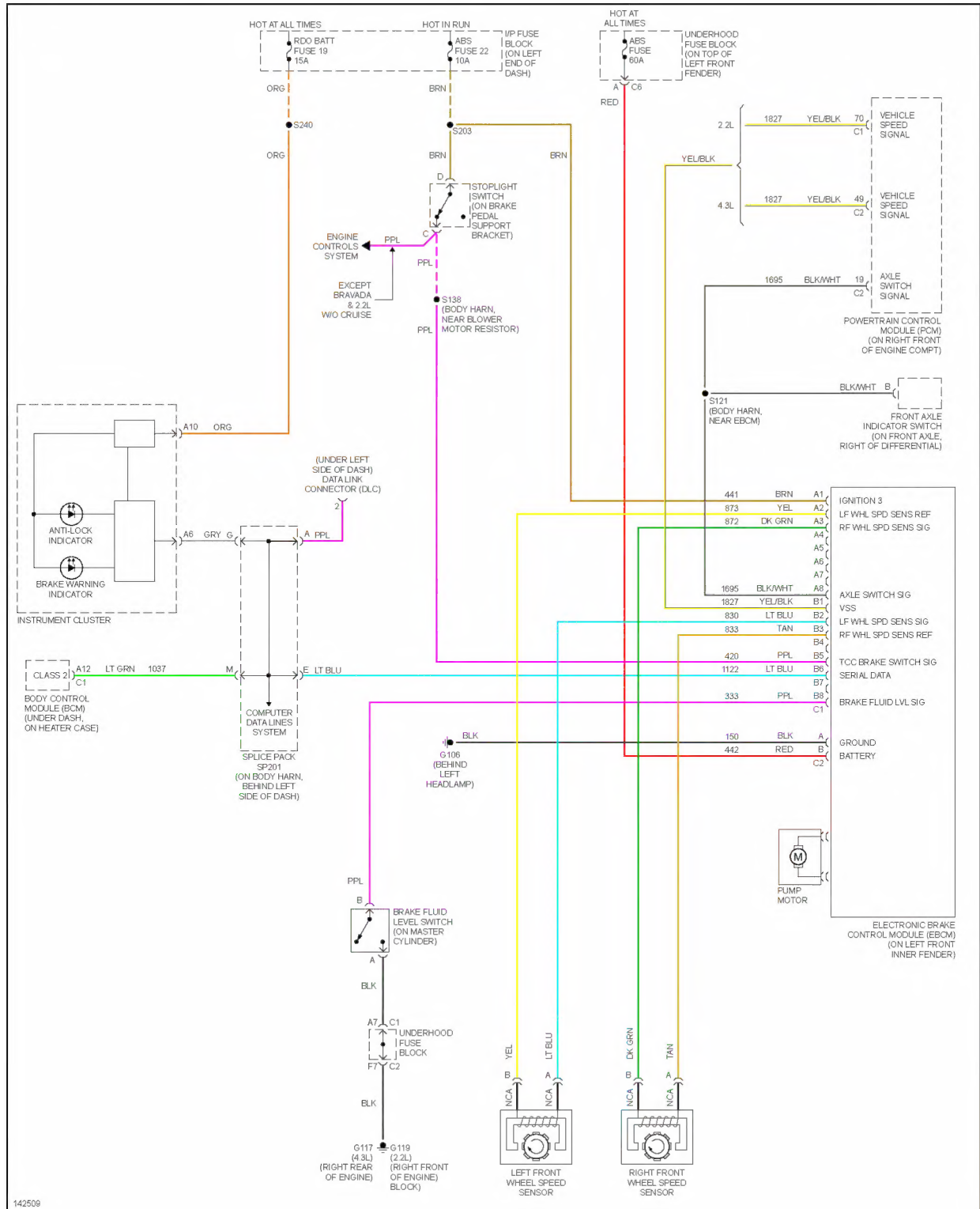


Fig. 3: 4WAL Brake System Wiring Diagram ("S" & "T" Series EBC325 - 2001)